

### **REMARKS**

Claim 19 was rejected under 35 U.S.C. §112, first paragraph. Claims 5, 11, 20 and 21 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claim 19 was rejected under 35 U.S.C. §112, second paragraph. Claims 5, 11, 20 and 21 were rejected under 35 U.S.C. §112, second paragraph. Claims 5 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over GB Patent No. 2 050 679 to Griepentrog et al. (hereinafter "Griepentrog") in view of U.S. Patent No. 4,842,054 to Nathenson et al. (hereinafter "Nathenson"). Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson and U.S. Patent No. 3,436,909 to Squires (hereinafter "Squires"). Claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson, Squires and U.S. Patent No. 4,236,968 to Werker et al. (hereinafter "Werker"). Claims 17 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog and Nathenson in view of U.S. Patent No. 4,714,593 to Naito et al. (hereinafter "Naito"). Claim 21 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson, or, in the alternative, over Griepentrog and Nathenson in view of U.S. Patent No. 3,218,807 to Berchtold et al. (hereinafter "Berchtold").

The previous claims have been canceled without prejudice and new claims 22 to 31 have been submitted, support being found for example in the original claims.

Reconsideration of the application based on the following remarks is respectfully requested.

#### **35 U.S.C. §112, first paragraph Rejections**

Claim 19 was rejected under 35 U.S.C. §112, first paragraph, because the specification, while being enabling for small deviations from pressure equilibration between first and second heat exchange gases was found to not reasonably provide enablement for conditions under reactor operation wherein pressure differences can exist between the first heat exchange gas and the second heat exchange gas ordained by the power level of the nuclear reactor.

Claims 5, 11, 20 and 21 were rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement with regard to the limitation "having an

operating temperature of at least 800°C” and the limitation “at a temperature between 550°C and 700°C.”

In an attempt to simplify the issues, and to address the Examiner’s concerns on functional language, new claims have been submitted. These claims do not contain the language objected to by the Examiner, and withdrawal of the rejections under 35 U.S.C. §112, first paragraph, to claims 5, 11, 19, 20 and 21 is respectfully requested.

35 U.S.C. §112, second paragraph, Rejections

Claim 19 was rejected under 35 U.S.C. §112, second paragraph, as being found incomplete for omitting essential elements, such omission amounting to a gap between the elements.

Claims 5, 11, 20 and 21 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention with regard to the new limitation “at a temperature between 550°C and 700°C” and with regard to the limitation “and a primary portion connected to the secondary circuit receiving the second exchange gas after it issues from the gas turbine at a temperature between 550°C and 700°C” being held poly-interpretable.

In an attempt to simplify the issues, and to address the Examiner’s concerns on functional language, new claims have been submitted. These claims do not contain the language objected to by the Examiner, and withdrawal of the rejections under 35 U.S.C. §112, second paragraph, to claims 5, 11, 19, 20 and 21 is respectfully requested.

35 U.S.C. 103(a) Rejections

Claims 5 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Griepentrog in view of Nathenson. Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson and Squires. Claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson, Squires and Werker. Claims 17 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog and Nathenson in view of Naito. Claim 21 was rejected under 35 U.S.C. §103(a) as being unpatentable over Griepentrog in view of Nathenson, or, in the alternative, over Griepentrog and Nathenson in view of Berchtold.

In a good faith attempt to clarify the issues, to positively recite features of the invention, and to remove the functional language identified by the Examiner, the applicant has canceled the previous claims without prejudice, and submitted a new claim set that is believed to deal with the primary prior art rejections at hand.

In particular, the applicant has made a good faith attempt to remove functional language, and to claim the fluid mediums positively. The use of the word “for” has been avoided.

Moreover, the structural connections have been clarified. For example, new claim 22 recites “the steam generator connected to the secondary circuit downstream of the gas turbine, and being heated by the mixture of helium and nitrogen in the secondary circuit” as shown for example in Fig. 1 where steam generator 12 is connected to the secondary circuit 9 downstream of the gas turbine 2.

Addressing the prior art references, it is admitted that Griepentrog shows a primary circuit circulating helium and a secondary circuit circulating helium and nitrogen. The helium and nitrogen drive a turbine to drive a generator. The present application discusses this reference, and it is respectfully submitted that a reading of Griepentrog makes clear that it would not have been obvious to one of skill in the art in view of Nathenson to have added a tertiary circuit with water and steam as now claimed.

Specifically, claim 22 as amended recites “a tertiary circuit including water and steam, the tertiary circuit circulating the water and the steam, the tertiary circuit including a steam generator and a steam turbine, the steam generator receiving the water at an inlet and providing the steam at an outlet, the steam driving the steam turbine, the steam generator connected to the secondary circuit downstream of the gas turbine, and being heated by the mixture of helium and nitrogen in the secondary circuit.”

The present invention thus uses the tertiary circuit to drive an extra steam turbine, which for example can be used to generate electricity, and, as would be understood to one of skill in the art, pulls substantial amounts of energy out of the secondary circuit.

Opposed to this structure, the main purpose of Griepentrop’s secondary circuit is to keep energy in the secondary circuit. A recuperator 12 is used to put energy from low pressure gas at duct 10 into compressed gas exiting compressor 18. See page 3, lines 47 to 57 of Griepentrop (“The gas flows first through the low pressure side and the utilizable heat

energy liberated is transferred to the compressed gas flowing through the high pressure side.”). Griepentrop has an elaborate system, including using energy to drive compressors 14, 16 and 18 and cooling the gas with coolers 13, 15, 17, to permit this high pressure side to exist and to permit the transfer of energy at recuperator 12.

It is respectfully submitted that one of skill in the art, reading Griepentrop and without the benefit of hindsight, would never have added a steam cycle to the Griepentrop device as Griepentrop is trying to keep as much energy as possible in the secondary circuit. All of the “utilizable” heat energy is designed to go back into the secondary circuit via the recuperator, and there is no reason or purpose to alter Griepentrop to destroy what seems to be a key feature of Griepentrop. See claim 1: “transferring said extracted heat to the compressed gas.”

In addition, it is respectfully submitted one of skill in the art would not find that the teachings of Nathenson with respect to the col. 2, lines 62 to 66 for its liquid metal and reduced temperatures are applicable to Griepentrop design, where it is specifically desired to transfer the heat back into a highly compressed gas at recuperator 12.

In light of the above, withdrawal of the rejections under 35 U.S.C. §103(a) to all of the claims as now submitted is respectfully requested. Applicant thanks the Examiner advance for a careful reconsideration of the issues, and respectfully hopes that the amendments have clarified the present invention.

With further respect to new dependent claim 31, none of the prior art references teach this feature as well.

**CONCLUSION**

It is respectfully submitted that the application is in condition for allowance and applicants respectfully request such action.

If any additional fees are deemed to be due at this time, the Assistant Commissioner is authorized to charge payment of the same to Deposit Account No. 50-0552.

Respectfully submitted,

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